Napoleon's Missed Opportunities to Maintain Combat Forces through Medical Innovations and Battling the Hidden Enemy

Napoleonic Warfare

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December 7, 2011

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Introduction

During Napoleon Bonaparte's reign the theory of miasma dominated and medicines were comprised of a combination of many drugs, often in excessive amounts that caused more harm than good. Moreover, while Napoleon revered the doctors he trusted, he failed to support their profession. It also seemed that Napoleon had the belief that a nation in arms is an inexhaustible reservoir of manpower. Therefore, these opinions could possibly explain his paradoxical attitude toward the medical profession and why he did not support his doctors. As the commander, Napoleon had the opportunity to enhance his combat capabilities with the advancement in medical innovations, but Napoleon's lack of support to maintain the health of his forces compromised his campaigns which ultimately was one reason that led to his downfall.

Medical Innovations in Combat Medicine

The medical profession in 18th-century France was a primitive occupation when compared to the sophisticated field of today. The majority of people including the medical professionals believed that exposure to bad air was responsible for sickness and wound infections. Hospitals would occasionally "air out" as a precautionary measure but the thought of cleaning one's hands or a patient's wounds was lacking. Miasma was the idea of infections and diseases like dysentery spreading by poisonous vapors that people breathed and it was the most popular theory in Europe at the time. Additionally, compared to today's standards surgery during this period would be considered barbaric. In most parts of the country, barbers and barber-surgeons whose expertise was based on a short apprenticeship and a willingness to learn at the patient's expense performed routine operations. All operations like amputations were performed with no anesthetic. So patients were held or chained down and the surgeon would use basic instruments such as a drill, a pair of pliers, or a saw. The surgeons did not sharpen the

tools prior to each surgery either. Yet, the method to control or stop bleeding was improved upon by using ligatures instead of cauterizing the wound with a red-hot poker or boiling oil.

When the wars began in 1792, military medicine received little support and it was outmatched by accelerated operations, unparalleled numbers in casualties and increased disease rates due to movement across the European continent and trade between different parts of the world. The quality of medical care varied based on the qualifications and dedication of the medical officers and the availability of medical supplies.[1] Some of these officers obtained an appointment as a regimental physician or surgeon after only a few months in a medical course so most training was acquired on-the-job at the expense of their patients. Furthermore in 1799, the Directory established a board consisting of non-medical professionals and generals to oversee the medical services. Even when Napoleon became First Consul, he assigned the medical service as a low priority. In fact, after the Treaty of Luneville he began discharging medical officers and abolishing a number of military hospitals.[2] Throughout Napoleon's reign, there were examples of poor medical care, and equally, instances of excellent ones. Undoubtedly with this combination of instances, he continued to mistrust the medical profession so Napoleon was willing to accept greater casualties rather than burden the movement of his armies with medical provisions.

Over the course of the wars during the Revolutionary and Napoleonic eras casualty rates increased. For the battles between 1792 and 1796, the normal number of casualties for the French was approximately 15%, but as the French army grew and the Empire expanded, the average had increased to 21%.[3] The collection of wounded from the battlefield during this time was haphazard at best. It was normal practice to leave soldiers no matter their injuries on the battlefield until the fight was over. Eventual evacuation of these men to field hospitals resulted

in the loss of manpower because it usually required up to six or eight men to help carry each wounded man and his belongings from the battlefield. A regiment which had twenty or thirty wounded, for instance, was soon reduced to one third its strength.[4] Also, the ambulances used by the French army at this time were large, cumbersome wagons drawn by as many as fifteen horses, they had no suspension or padding which caused more agonizing pain for the wounded during the ride, and remained a far distance from the battlefield; usually a league which equated to approximately three to three and a half miles.[5] With the delay in evacuation and insufficient transportation methods, it could take up to a day or even longer before men received any type of treatment and so this usually resulted in many unnecessary deaths due to hemorrhage. Napoleon's Surgeon-in-Chief to the French army, Pierre Francois Percy, stated "…there is no more frightful a spectacle than the evacuation of mutilated soldiers on big wagons…they have to suffer from rain, from suffocating heat or freezing cold and often do not have aid of food of any sort. Death would be a favor…".[6] Therefore, the real progress in ambulance design began within the army, with Percy himself. He designed an ambulance, known as the *wurst*, which would actually bring the surgeons and their instruments closer to the fighting. Percy mounted the surgeons astride an elongated carriage which contained the medical supplies, e.g., dressings and surgical instruments.[7] Then litter bearers would fan out to collect the wounded. Even though the *wurst* rose morale by reassuring soldiers that if they were wounded they would receive first aid with an unprecedented speed and it usually ensured that the wounded did not fall into the hands of the enemy, Percy was continually frustrated with the lack of resources to fund his ambulance. During the early battles of 1800, he began dealing with either a denial of use or shortage of available horses. Other instances, Percy was denied wagons because they were used to carry the women and children who followed the army.[8]

In his efforts to solve the army's casualty evacuation problems, Percy's idea was soon eclipsed by a new concept for an ambulance. The Baron Dominique Jean Larrey, a French surgeon for Napoleon's army, created one of the greatest inventions of military medicine, the flying ambulance.[9] At the request of Napoleon, Larrey was sent to Italy in 1796 to aid in the medical affairs of the military campaign. He was depressed and mournful at the idea that the ambulances had to remain a league from the army while the wounded were obliged to remain on the field of battle until after the combat.[10] In action, Larrey observed the French artillery's ability to quickly mobilize and escape from the hands of the advancing enemy. He began formulating an idea to construct an ambulance in such a manner that it would provide readily transportation for the wounded during battle.[11] This inspired him to invent a light, two horse drawn carriage which hung on springs and followed the advanced guard in the same manner as the mobile artillery; hence, the flying ambulance.[12] It also contained a fixed mattress and the panels were padded up to a foot for added comfort during transport. Of course the carriage design was not always suited for every mission or environment, but it did adapt. For example, in rugged mountains, it had to be supplemented with mules for carrying supplies. Likewise, in the deserts of Egypt, camels were employed to augment casualty transport.[13] In contrast to Percy's *wurst* which brought the medical treatment on to the field and moved the wounded by litters. The flying ambulance was a means of rapidly bringing the initial medical care to wounded men and then promptly removing them from the field for more sophisticated treatment elsewhere.[14] This also gave inception to modern day MEDEVAC.[15] Additionally, Larrey's ambulance was less vulnerable to the dangers of battle. It was composed of a large number of carriages so the loss of one vehicle would not have been a crushing blow.[16] Lastly, Larrey placed the ambulances as close to the line of battle as he could to ensure rapid evacuation which permitted immediate

treatment of the wounds, including amputations of the severely injured limbs that occurred in battle.

Even with the overshadowing of Percy's *wurst* by Larrey's flying ambulance, Percy continued to impact the future of military medical services. He not only believed field hospitals should be sanitary but as safe as possible. In 1800 Percy drafted a document which explored the concept of military hospitals being sacred and secure from violation. He felt that hospitals on both sides of the fight should be treated as sanctuaries for the wounded and sick. The hospitals were to be indicated by signs and avoided by combat troops. This revolutionary idea was taken up in 1863 by the founder of the Red Cross and later incorporated into the Geneva Convention.[17]

Napoleon introduced a new form of war based on speed and mobility; however, the weaponry changed little during the Revolutionary war and Napoleonic era.[18] The knowledge of this weaponry facilitated the understanding of the major types of wounds suffered by the French soldiers. For instance, among the most common injuries in Napoleonic battles were fractures.[19] Larrey was a great innovator because he brought to light the ignored idea of immobilizing fractures in order to reduce pain and promote healing. He insisted fractured limbs should be held in place by *appareil inamovible* which translated as "fixed appliance", the precursor to modern plaster casts.[20] On the other hand, the weaponry was known to cause more severe limb injuries that carried a worse prognosis than simple fractures. For example, the destructive power of lead musket balls shot at less than fifty meters could shatter a man's major limb bones and joints.[21] Also, any soldier unfortunate enough to be in the path of a cannon ball suffered extensive damage to bones, joints, and soft tissue. Moreover, artillery shell fragments resulted in compound fractures of bones and torn flesh. Even the broadswords of the cavalry were capable of breaking bones and severing limbs. Therefore, amputation was the choice for soldiers who

received severe bone injuries where there was not the option to save the limb. Surgeons thought it best to wait and give the wounded time to recover before surgery. Of course most men died while waiting due to infections or loss of blood. On the contrary, Larrey stressed early intervention because the shock of the injury rendered the wound relatively insensitive with corresponding reduction in stress when the operation was performed after the injury.[22] This is due to the fact that when the brain is in shock, the muscles relax and there tends to be lower blood pressure in the injured area. Thus, making it easier to cut through the flesh with less pain and blood. The speed and skill of the surgeon may have also reduced stress. Case in point, in 1812 at the Battle of Borodino, Larrey performed close to 200 amputations in a 24-hour period, 1 every 7.2 minutes. Larrey and his colleagues annotated a 75% recovery rate among the patients whom they performed amputations.[23] Finally, he introduced the technique to amputate the arm at the shoulder joint to reduce pain and to avoid the need to cut through bone and muscle.

When the time came to operate, there was a hierarchal system: first the officers, then the soldiers and last the enemy; no matter the severity of the injury. Larrey stated that "those who are dangerously wounded should receive the first attention without regard to rank and distinction".[24] Thus, he pioneered a system to treat the wounded based on severity of injury rather than rank of the soldier, i.e. the triage system that is still used today in combat and civilian medicine. It is a simple system to ration limited medical resources when the number of injured needing care exceeds the available resources, e.g., supplies, medical personnel. Larrey used this method to quickly evaluate and categorize the wounded in battle and then evacuated those requiring the most urgent medical attention first.

In order to avoid overwhelming the hospitals with all the wounded and sick men, Percy supported the regimental infirmaries. Usually soldiers with minor injuries or illnesses were

treated at these clinics. The advantage allowed the men to remain with their unit, provided a consistency of care by having the same doctor, and ensured a quicker turnaround time for the men to return to combat.

French medicine changed dramatically after the Revolution and on through the Napoleonic era. The development of an effective French combat casualty transport system during the Napoleonic Wars was essentially the result of one man's ingenuity and initiative. After Napoleon crowned himself Emperor, he instituted the Legion of Honor medal, France's highest military award, which Larrey was one of the first recipients as recognition of his outstanding service to military medicine.[25] Nevertheless, this may have been more of a calculated move on Napoleon's part for troop morale since the soldiers loved and respected Larrey than giving respect to a profession he distrusted. Furthermore, Larrey's dedication and innovations, e.g., flying ambulances and triage, brought transformation to patient care. But in spite of these innovations, diseases placed a heavy toll on the armies. There is no reliable data showing the overall number of casualties between the years of 1792-1815; however, French historian Jacques Houdaille estimated that just during the period of 1803-1815 of the Frenchmen recruited to fight approximately 178,500 men died of disease compared to 53,550 men that died in combat or result of their wounds.[26]

Diseases Plague Napoleon's Forces

Despite living in an era with incessant conflict, Napoleon's forces were more likely to succumb to disease than meet a death due to combat injuries. Many of the doctors to include Larrey relied on the miasma theory to explain the fevers that afflicted the troops. Fever was a general term used to describe infectious diseases like plague, dysentery, and typhus which thrived with poor hygiene and with the cold because men huddled together to keep warm. As

stated previously, Napoleon did not trust doctors and believed "medicine is the science of assassins".[27] Additionally, mental fortitude was the only remedy; if one is not strong enough to resist disease then it would claim you. One reason for Napoleon's mindset came during his early years when he came down with a serious fever but survived with no after effects. Another instance was when Napoleon was a junior officer, he survived what is believed to be a bout of a less severe strain of malaria while still managing to study for eighteen hours through the pain, headaches, and intermittent fever.[28] Furthermore, Napoleon thought that those who died of disease were not good enough, not determined enough to survive. With a nation in arms, France's conscripts were a seemingly endless supply of manpower for the French armies. Indeed, this opinion fed to the low priority of disease prevention and control among the soldiers. However, if Napoleon had at least concentrated on enforcing measures to reduce the disease casualties amongst his forces, then he would have preserved a greater and experienced fighting strength which possibly could have led to a different outcome not only in the 1812 Russian campaign but overall for the French Empire.

Prolonged campaigns in different countries resulted in baffling new challenges for Napoleon's doctors. Firstly during the Egyptian campaign in 1798 and 1799, bubonic plague swept through the ranks of Napoleon's forces and blunted their effectiveness. Soldiers saw the disease spread among their comrades and they feared for their own lives. Moreover, Larrey's explanation of the disease explained why men feared it: "If the patient was marching he fell into convulsions and violent distortions of the face…thick fetid saliva flowed involuntarily…the eyes were opened; they seemed to project from their sockets…the patient writhed, uttered some mournful cries and expired immediately".[29] When the plague first broke, the mortality rate was around 80%. Then at the height of the epidemic, it was estimated that Napoleon lost about thirty

men a day.[30] Both Napoleon and his medical staff referred to the disease as a fever brought in on the winds. His chief doctor of the army, Rene-Nicolas Desgenettes, believed the significant rise in deaths was from the pernicious exhalations of animal carcasses and excreta. Even Larrey alluded to the winds being “loaded with the putrid effluvia of animal and vegetable substances decomposed by the heat in the lakes”.[31] So their consistent claims that the "fever" was not contagious, in fact, accurately characterized the bubonic plague but were based on the wrong etiology. Plague is caused by a bacterium called *Yersenia pestis* and is transmitted from rodent-to-human and human-to-human by the bite of infective fleas. It is characterized by periodic outbreaks among the rodent population. During the outbreaks, the infected fleas lose their normal hosts so they seek out new sources of blood and thus increase the risk to humans. Initial manifestations include fever, headache, and general illness. This is followed by the pathognomic sign of plague which is a very painful, usually swollen lymph node referred to as a bubo. Buboes are commonly found in the armpit, groin, and neck region and are the first step of a progressive illness. The disease progresses rapidly and the bacteria can invade the bloodstream which results in fatal illness if not treated. During this time period since there were no available antibiotics or a proper understanding of the disease, isolation of the sick from the healthy and destruction of all the bodies such as burning would have been the best measure to control and stop the spread of disease. So in order to boost troop morale from the demoralized effects of the plague, Napoleon touched plague-stricken men to squash the rumors that the "fever" was contagious and incurable. He thought fear caused the disease to spread more than anything else so the principal seat of the plague was in the imagination and that all those whose imagination was struck by fear died of it. Therefore the surest protection, the most efficacious remedy, was moral courage.[32] Thus Napoleon's action in touching a bubo was meant to disprove the notion

that the disease was contagious.

Secondly, Napoleon's men were just as vulnerable to disease in Europe as in the Orient. Soldiers were known to suffer from a bowel disease known today as dysentery. Epidemics of dysentery were frequent occurrences in army camps where men were together in close quarters with poor sanitation because it commonly spread from stools or soiled fingers of one man to the mouth of another. Dysentery is a common but potentially serious disorder of the digestive tract. Usually the milder cases of dysentery are difficult to distinguish from other forms of diarrhea because of similar symptoms like abdominal cramping, fever and tenesmus. However, the more severe cases developed the characteristic sign of bloody diarrhea. Dysentery was the most common affliction of the Grand Army in the winter of 1806-1807. Additionally during the first weeks of the 1812 campaign, dysentery afflicted some 80,000 soldiers.[33] While the men marched, they clutched their stomachs and quickly dashed to the sides of the road. "On some stretches of road I had to hold my breath in order not to bring up liver and lungs and even to lie down until the need to vomit had died down" wrote one soldier.[34] Even if dysentery did not kill the soldiers, it incapacitated them to the point that they were ineffective to complete the mission of battle.

Lastly, dysentery alone could cause death but it usually debilitated men making them more vulnerable to other prevalent fevers like typhus. Typhus was an inevitable companion of war because war provided the perfect conditions of poor personal hygiene and overcrowding which lice thrive and epidemic typhus proliferates; no one could escape it.[35] Epidemic typhus is caused by *Rickettsia prowazekii* and transmitted to humans by the infected body louse. Since body lice live in the clothing of soldiers, epidemic typhus is more prevalent during the cold months when heavy clothing is worn for an extended period of time without being laundered and

men did not bathe as often. The body louse feeds up to five times per day and has a lifespan of about four to twelve weeks. Transmission of *R. prowazekii* occurs by the contamination of bite sites with the feces from the infected louse. The infected soldiers developed a high fever and other additional symptoms including muscle pain, joint stiffness, delirium, and headache. After a few days, a petechial rash begins on the chest and spreads to the rest of the body except for the palms of the hands and soles of the feet. During the years of 1805-1814, typhus took a heavy toll on the Grand Army. After the Battle of Austerlitz, the 18,000 typhus related deaths eclipsed the combat losses.[36] Yet, the most remarkable and significant results of disease during the Napoleonic era was the decimation of Napoleon's Grand Army in Russia.[37] Napoleon led close to 600,000 men into Russia to conquer his last major opponent on the continent. However, when he finally reached Moscow, the Grand Army consisted of only 95,000 men.[38] The majority of the 500,000 soldiers that died succumbed to dehydration, starvation, and diseases; 20% of the troops were likely to have died from epidemic typhus.[39]

In sum, the consequences of casualties caused by infection and disease have a devastating impact on an army. Therefore, the success of a commander is contingent on the ability of his soldiers to perform their mission so maintaining the health of those soldiers is critical. Without Percy's and Larrey's dedication to their profession, Napoleon's forces and today's medical society may not have reaped the benefits of their visions and innovations: protected hospitals in combat zones, triage, and evacuation. Additionally, the improved delivery of combat medical care provided resources in manpower because Larrey was able to return wounded men back to duty. Even though the major focus in the Napoleonic wars was treatment of the wounded, disease played a key role in the battles fought. Moreover, the effects of disease upon Napoleon and his army were too much even for the great General to overcome. He may not have foreseen

the destruction, but Napoleon could have lessened the impact of disease on his army after it began to take hold. For example, there were many contributing factors that led to the demise of Napoleon's men during the march to Moscow, but a third of the deaths could have been prevented with medical support. Thus, the outcomes of war could have played differently for Napoleon and France had the Emperor given more emphasis on disease.

[1] Rothenburg, *The Art of Warfare*, 228.
[2] Ibid., 230.
[3] Howard, *Napoleon's Doctors*, 75.
[4] Ibid., 73.
[5] AWC website
[6] Ibid.
[7] Howard, *Napoleon's Doctors,* 82.
[8] Ibid., 84.
[9] Ibid., 80.
[10] Larrey, *Memoirs*, 7.
[11] AWC website
[12] Larrey, *Memoirs*, 7.
[13] *Memoirs of Military Surgery*, 81-82.
[14] Howard, *Napoleon's Doctors,* 81.
[15] *Military Casualty Evacuation*
[16] Howard, *Napoleon's Doctors,* 88.
[17] Ibid., 158.
[18] Ibid., 98.
[19] Ibid., 184.
[20] Ibid.
[21] Ibid., 77.
[22] Combat Casualty Care.
[23] Ibid.
[24] Howard, *Napoleon's Doctors* ,103.
[25] Journal of Emergency.
[26] Howard, *Napoleon's Doctors*, 97.
[27] Talty, *The Illustrious Dead*, 41.
[28] Ibid.
[29] Howard, *Napoleon's Doctors*, 208.
[30] Rumor, Contagion, and Colonization.
[31] Howard, *Napoleon's Doctors*, 201.
[32] Rumor, Contagion, and Colonization.
[33] Talty, *The Illustrious Dead*, 63
[34] Howard, *Napoleon's Doctors*, 214.
[35] Ibid., 211.
[36] Ibid., 213.
[37] Rothenburg, *The Art of Warfare*, 237.
[38] Connelly, *The Wars of the French Revolution and Napoleon*, 178.
[39] Lancet

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